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21 Session P11: visualization systems and image-based 77%

visualization: Sea of images

Daniel G. Aliaga , Thomas Funkhouser , Dimah Yanovsky , Ingrid Carlbom

Proceedings of the conference on Visualization '02 October 2002

A long-standing research problem in computer graphics is to reproduce the visual experience of walking through a large photorealistic environment interactively. On one hand, traditional geometry-based rendering systems fall short of simulating the visual realism of a complex environment. On the other hand, image-based rendering systems have to date been unable to capture and store a sampled representation of a large environment with complex lighting and visibility effects. In this paper, we prese

...

22 Session P9: interactive volume rendering: RTVR: a flexible java 77%

library for interactive volume rendering

Lukas Mroz , Helwig Hauser

Proceedings of the conference on Visualization 2001 October 2001

This paper presents several distinguishing design features of RTVR - a Java-based library for real-time volume rendering. We describe, how the careful design of data structures, which in our case are based on voxel enumeration, and an intelligent use of

look-up tables enable interactive volume rendering even on low-end PC hardware. By assigning voxels to distinct objects within the volume and by using an individual setup and combination of look-up tables for each object, object-aware rendering i ...

23 Object-based image editing

77%



William A. Barrett , Alan S. Cheney

ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques July 2002

Volume 21 Issue 3

We introduce Object-Based Image Editing (OBIE) for real-time animation and manipulation of static digital photographs. Individual image objects (such as an arm or nose, Figure 1) are selected, scaled, stretched, bent, warped or even deleted (with automatic *hole filling*) - *at the object, rather than the pixel level* - using simple gesture motions with a mouse. OBIE gives the user direct, local control over object shape, size, and placement while dramatically reducing the time require ...

24 Hierarchical pattern mapping

77%



Cyril Soler , Marie-Paule Cani , Alexis Angelidis

ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques July 2002

Volume 21 Issue 3

We present a multi-scale algorithm for mapping a texture defined by an input image onto an arbitrary surface. It avoids the generation and storage of a new, specific texture. The idea is to progressively cover the surface by texture patches of various sizes and shapes, selected from a single input image. The process starts with large patches. A mapping that minimizes the texture fitting error with already textured neighbouring patches is selected. When this error is above a threshold, the patch ...

25 Precomputed radiance transfer for real-time rendering in

77%



dynamic, low-frequency lighting environments

Peter-Pike Sloan , Jan Kautz , John Snyder


ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques July 2002

Volume 21 Issue 3

We present a new, real-time method for rendering diffuse and glossy objects in low-frequency lighting environments that

captures soft shadows, interreflections, and caustics. As a preprocess, a novel global transport simulator creates functions over the object's surface representing transfer of arbitrary, low-frequency incident lighting into *transferred radiance* which includes global effects like shadows and interreflections from the object onto itself. At run-time, these transfer functio ...

26 Homomorphic factorization of BRDF-based lighting computation 77%

 Lutz Latta , Andreas Kolb

ACM Transactions on Graphics (TOG) , Proceedings of the 29th annual conference on Computer graphics and interactive techniques July 2002

Volume 21 Issue 3

Several techniques have been developed to approximate Bidirectional Reflectance Distribution Functions (BRDF) with acceptable quality and performance for realtime applications. The recently published *Homomorphic Factorization* by McCool et al. is a general approximation approach that can be used with various setups and for different quality requirements. In this paper we propose a new technique based on the Homomorphic Factorization. Instead of approximating the BRDF, our technique factoriz ...

27 A system for geographical and spatial data exploration on the 77%

 internet

Celyn S. L. Chan , Tony K. Y. Chan , Edmond C. Prakash

Selected papers from the Pan-Sydney workshop on Visualisation -

Volume 2 December 2000

Developing a detailed 3D conceptual spatial data model and incorporating it for visualization, is a promising method of Spatial Data Exploration for a variety of applications especially in the display, analysis and interpretation of useful and timely meteorological and geographical information. Spatial Data Exploration is quite complex due to the following factors: i) the spatial nature of data that is being processed ii) time-variant nature of data. In this paper we present a new system that can u ...

28 Session E: Interaction in mixed realities: Interacting with 77%

 spatially augmented reality

Ramesh Raskar , Kok-Lim Low

Proceedings of the 1st international conference on Computer graphics, virtual reality and visualisation November 2001

We present the notion of projector-based *spatially augmented reality* (SAR), and explore how it can be used as an effective user interface to enable users to easily and naturally interact with their

real physical environment and the virtual environment. In SAR, the user's physical environment is illuminated with images projected from the projectors. We then describe a framework that can easily incorporate different types of interactions on a continuum of display surfaces and input devices. ...

29 Session A: Computer graphics: Implementation and applications 77%

 of the distortion operator

Shaun Bangay

Proceedings of the 1st international conference on Computer graphics, virtual reality and visualisation November 2001

The distortion operator transforms 2D images in a manner similar to image warping or morphing, allowing source pixels to be mapped to any destination pixel. This operator can be implemented on current hardware, allowing at least one distortion per frame at interactive frame rates. Potential applications are numerous, but those described include re-mapping images for correct projection onto curved screens, correcting camera distortion from multiple sources simultaneously, and allowing constant ti ...

30 Display Devices: Life-sized projector-based dioramas 77%

 Kok-Lim Low , Greg Welch , Anselmo Lastra , Henry Fuchs

Proceedings of the ACM symposium on Virtual reality software and technology November 2001

We introduce an idea and some preliminary results for a new projector-based approach to re-creating real and imagined sites. Our goal is to achieve re-creations that are both visually and spatially realistic, providing a small number of relatively unencumbered users with a strong sense of immersion as they jointly *walk* around the virtual site. Rather than using head-mounted or general-purpose projector-based displays, our idea builds on previous projector-based work on *spatially-augmented* ...

31 Papers: Information visualization: A framework for unifying 77%

 presentation space


M. S. T. Carpendale , Catherine Montagnese

Proceedings of the 14th annual ACM symposium on User interface software and technology November 2001


Making effective use of the available display space has long been a fundamental issue in user interface design. We live in a time of rapid advances in available CPU power and memory. However, the common sizes of our computational display spaces have only minimally increased or in some cases, such as hand held devices,

actually decreased. In addition, the size and scope of the information spaces we wish to explore are also expanding. Representing vast amounts of information on our relatively small ...

32 Computing curricula 2001 77%


 Journal of Educational Resources in Computing (JERIC) September 2001

33 Vertex-based anisotropic texturing 77%

 Marc Olano , Shrijeet Mukherjee , Angus Dorbie
Proceedings of the ACM SIGGRAPH/EUROGRAPHICS workshop on Graphics hardware August 2001

MIP mapping is a common method used by graphics hardware to avoid texture aliasing. In many situations, MIP mapping over-blurs in one direction to prevent aliasing in another. Anisotropic texturing reduces this blurring by allowing differing degrees of filtering in different directions, but is not as common in hardware due to the implementation complexity of current techniques. We present a new algorithm that enables anisotropic texturing on any current MIP map graphics hardware supporting MI ...


34 Plenoptic stitching: a scalable method for reconstructing 3D 77%

 interactive walk throughs
Daniel G. Aliaga , Ingrid Carlbom
Proceedings of the 28th annual conference on Computer graphics and interactive techniques August 2001

Interactive walkthrough applications require detailed 3D models to give users a sense of immersion in an environment. Traditionally these models are built using computer-aided design tools to define geometry and material properties. But creating detailed models is time-consuming and it is also difficult to reproduce all geometric and photometric subtleties of real-world scenes. Computer vision attempts to alleviate this problem by extracting geometry and photogrammetry


from images of the real ...

35 Photorealistic rendering of knitwear using the lumislice 77%

 Ying-Qing Xu , Yanyun Chen , Stephen Lin , Hua Zhong , Enhua Wu , Baining Guo , Heung-Yeung Shum
Proceedings of the 28th annual conference on Computer graphics and interactive techniques August 2001


We present a method for efficient synthesis of photorealistic free-form knitwear. Our approach is motivated by the observation that a single cross-section of yarn can serve as the basic primitive for modeling entire articles of knitwear. This primitive, called the *lumislice*, describes radiance from a yarn cross-section based on fine-level interactions — such as occlusion, shadowing, and multiple scattering — among yarn fibers. By representing yarn as a sequence of identical ...

36 Texture synthesis over arbitrary manifold surfaces 77%

 Li-Yi Wei , Marc Levoy
Proceedings of the 28th annual conference on Computer graphics and interactive techniques August 2001

Algorithms exist for synthesizing a wide variety of textures over rectangular domains. However, it remains difficult to synthesize general textures over arbitrary manifold surfaces. In this paper, we present a solution to this problem for surfaces defined by dense polygon meshes. Our solution extends Wei and Levoy's texture synthesis method [25] by generalizing their definition of search neighborhoods. For each mesh vertex, we establish a local parameterization surrounding the vertex, use thi ...


37 The digital atheneum: new approaches for preserving, restoring 77%

 and analyzing damaged manuscripts
Michael S. Brown , W. Brent
Proceedings of the first ACM/IEEE-CS joint conference on Digital libraries January 2001


This paper presents research focused on developing new techniques and algorithms for the digital acquisition, restoration, and study of damaged manuscripts. We present results from an acquisition effort in partnership with the British Library, funded through the NSF DLI-2 program, designed to capture 3-D models of old and damaged manuscripts. We show how these 3-D facsimiles can be analyzed and manipulated in ways that are tedious or even impossible if confined to the physical manuscript.

...

38 A continuous clustering method for vector fields 77%


 H. Garcke , T. Preußer , M. Rumpf , A. Telea , U. Weikard , J. van Wijk
Proceedings of the conference on Visualization '00 October 2000

39 Orchestrating a mixed reality performance 77%

 Boriana Koleva , Ian Taylor , Steve Benford , Mike Fraser , Chris Greenhalgh , Holger Schnädelbach , Dirk vom Lehn , Christian Heath , Ju Row-Farr , Matt Adams
Proceedings of the SIGCHI conference on Human factors in computing systems March 2001

A study of a professional touring mixed reality performance called Desert Rain yields insights into how performers orchestrate players' engagement in an interactive experience. Six players at a time journey through an extended physical and virtual set. Each sees a virtual world projected onto a screen made from a fine water spray. This acts as a traversable interface, supporting the illusion that performers physically pass between real and virtual worlds. Live and video-based observations o ...

40 Adaptive unwrapping for interactive texture painting 77%

 Takeo Igarashi , Dennis Cosgrove
Proceedings of the 2001 symposium on Interactive 3D graphics March 2001

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